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POS536 **2nd Weekly Report** **25.08.-01.09.2019**

We finished the sampling at the six stations in our rectangular working area between 33° 09.00 N/40° 00.00'W and 33° 15.00'N/ 37° 00.00'W by the end of the second week of the cruise. Since we are almost two days ahead of our schedule, we added an extra station at 34° 14.74'N/37° 00.76'W, which we will reach in the morning of September 2nd. As soon as we have also collected material at this position, we will retrieve the drifting sediment traps that we deployed for a second time on August 29th. After the traps will have been recovered on September 3rd, we will leave the working area and start our transit to Malaga, Spain.

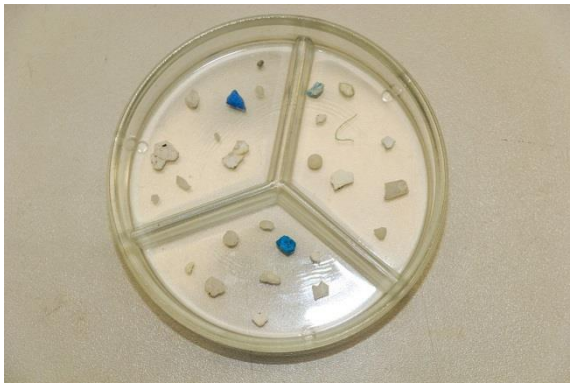
Almost all sampling activities that we accomplished so far were successful. The only exception is the multi-corer, which serves to extract multiple sediment cores from the seafloor. We deployed it for four times at two different stations, but unfortunately it never collected any material. The reason for this is that the seabed here apparently consists of silty-sandy sediments that are very dense and hard. However, the sampling with a box corer, which is much bulkier and heavier than the multi-corer, was successful and we therefore will not leave the Sargasso Sea without seafloor samples.

Sediment sampling with the box corer.

We already accomplished a major part of our mission, but did we observe microplastics in the samples we collected? The answer is "yes", but these are preliminary results that still need to be validated with spectroscopic analyses. Furthermore, we can so far only speak about relatively large fragments between 1 and 5 mm, which we observe in our material during cursory inspections with the naked eye or with a stereomicroscope. Although the inspections are rather superficial, we found significant quantities of particles, which are very likely plastic, in the surface samples that were taken with the catamaran trawl and a mesh-size of 0.3 mm.

Surface sampling with the catamaran trawl.

The photo below shows the amount of potential plastic particles that was found in a surface trawl that covered an area of approximately 2000 m^2. This picture is representative, since almost all other catamaran trawls contained similar numbers of fragments and fibers. This confirms that we are in a garbage patch, although this is something one would not easily guess at first glance. This is due to the fact that in this sea area large litter items are rather rare. So far we did 43 hours of visual litter surveys from the foredeck of RV POSEIDON, during which we commonly saw one or two large litter objects per hour (while steaming at a speed of 9 kn).



Amount of potential plastic particles in one surface trawl.

In contrast to the water surface, we observed much fewer potential plastic particles in the net samples that we collected in depths between 10 and 300 m. This indicates that the particle density below the water surface is by orders of magnitude lower than at the surface. This is plausible, since once floating fragments and fibers become negatively buoyant, for instance through biofouling, they leave the rather two-dimensional water surface and enter the three-dimensional water body. However, we will not obtain the full picture before we have analysed all the sample material with spectroscopic methods. This will also allow us to detect plastic particles in the size range between 0.02 and 1 mm, which may also be hidden in the gastro-intestinal tracts of the pelagic organisms that we collected with the net trawls.

Visual litter surveys during our transits give information about the abundance of large litter items. Photo: Jon Roa

Last but not least, the working atmosphere and the weather continued to be excellent during the second week of the cruise.

Mark Lenz (Chief Scientist)